

# Index

## To

## 1931 Transactions

### A

	<i>Page</i>
Acid-testing irons, Analysis for.....	64
Agricultural-implement cast iron, Analyses for.....	61
Alloy steels for casting, Chemical composition as employed for classifying carbon and.....	257
Alloys:	
Cast iron, in the electric furnace.....	594
For bronze pressure castings.....	497
Aluminum:	
As supplementary deoxidizer in steel castings.....	872
Testing fluidity of melted.....	526
Aluminum Alloys:	
Fluxing, before pouring.....	300
In permanent molds.....	400
Aluminum-Alloy Castings:	
Chills used in making.....	305
Composition of.....	304
Heat treatment of.....	301
Molding practice for heat-treated.....	297
Pouring temperature control for.....	300
X-ray as production tool to improve quality of.....	174
Apprentices:	
Costs of related instruction for foundry.....	316, 321
Municipally conducted continuation schools for foundry.....	316
Plant-operated classes for.....	320
Related class-room training for foundry.....	312
Apprenticeship, Getting under way a program of community.....	336

### B

Bearing bronze, Nickel additions to.....	109
Bentonites and clays for rebonding foundry sands.....	544
Bibliography:	
On fluidity testing.....	531
On testing cast iron.....	705
Binders for steel foundry sands.....	830
Bond Clays:	
Recommended methods for testing.....	561
Tests of sand mixtures and.....	546
Bonding strength, Loss of, by heating.....	165
Brake drums, Analysis for auto.....	60
Brass:	
Cupola melting of.....	602
Deep etching of, applied to gating problems.....	843
Nickel additions to red and yellow.....	102
Brass Alloys, Recommended practice for 85-5-5-5 and 80-10-10.....	38, 45
Brass Castings:	
Effect of pouring temperature on physical properties of.....	847
Gating tensile test bars for.....	844

	<i>Page</i>
Brasses, Red, in permanent molds.....	400
British foundry industry, Notes on structure of.....	1
Bronze:	
Effect of nickel in gear and other types of.....	102
Nickel additions to bearing.....	109
Size and shape of test bars for.....	99
Bronze Castings:	
Gating permanent-mold.....	404
Permanent-mold foundry practice for.....	393
Bronze foundry mixtures, Effects of nickel on.....	93
Bronze hydraulic-cylinder casting, Methods for producing.....	501
Bronze Pressure Castings:	
Gates for.....	500
Manufacture of.....	496
Bronzes:	
Comparison of Brinell hardness of sand-cast and permanent— mold-cast .....	397
Comparison of resistance to tension and shear tests on.....	690
Pouring temperatures for permanent-mold.....	401

## C

Carbon and silicon control in melting cast iron in electric furnace...	590
Carbon content of cast iron, Influence of phosphorus on.....	931, 934
Car wheels, Analysis for.....	64
Cast Iron:	
Alloys of, in electric furnace practice.....	594
Analyses for various castings of.....	61
Austenite dendrite and ledeburite in.....	758
Bibliography on testing.....	705
Brinell hardness tests of.....	684
Carbon and silicon control of, in electric furnace.....	590
Chauvin's extensometer for testing.....	694
Chilled .....	770, 788
Chromium in.....	151, 797
Cold and hot-blast cupolas used in investigation of soaking time of	913
Costs of melting, in electric furnace.....	246, 590
Cupola high-test and alloy, in machine-tool and gray iron job- bing foundry.....	115
Duplexing process for producing.....	586
Effect of microscopic structures on.....	747
Effect of phosphorus on machining qualities of malleable and gray	951
Effect of slight variations in hardness of, on resistance to shear..	697
Effect of sulphur and manganese in.....	783
Electric process, for cylinder and cylinder-head castings.....	585
Flow diagram of moisture-removing system in melting.....	278
Fluidity tests on.....	285
Graphite in.....	762, 821
Hardness of high-test.....	131, 592
Heat and growth resistant.....	153
High-strength, from indirect-arc furnace.....	244
History of testing.....	662
Impact testing of electric-furnace.....	596
Influence of phosphorus on physical properties of.....	931-939
Melting malleable and gray, in indirect-arc furnace.....	225, 236
Microscope as a practical aid in founding.....	733
Mixtures for high-test.....	128
Modulus of elasticity of.....	691
Molybdenum-treated high-test.....	146
New type of inclusion in, and relation to manganese and silicon content .....	423, 425

Cast Iron:	
Nickel in high-test.....	144, 148, 797
Oxidation of, during melting.....	281
Patternmaker's shrinkage of high-test.....	140
Phosphorus as affecting fluidity of.....	788
Phosphorus in.....	822
Physical properties of electric-melted.....	592
Recommendations to buyers of castings of.....	452
Refractories costs of melting malleable and gray.....	248, 251
Reports of committees on recommended practices for.....	49
Sands and core mixtures for molds for high-test.....	122
Shear tests of.....	681
Shock tests of.....	665, 668
Silicon effects on.....	739, 768, 817
Solid solutions in.....	737
Solidification point of, as affected by phosphorus.....	929
Sorbic structure and spheroidized pearlite in.....	753
Structures of high-test.....	127
Sulphur and carbon content of, as affected by soaking time.....	920
Tension tests of.....	667
Testing mechanical properties of.....	688
Tests on high-test.....	125
Cast Iron Samples:	
Etching of, for microscopic examination.....	814
Preparation of, for microscopic examination.....	810
Chauvin's extensometer for testing cast iron.....	694
Chilled cast iron.....	770, 788
Chills used in making aluminum-alloy castings.....	305
Chromium in cast iron.....	151, 797
Clay content, Effect of, on surface qualities of castings.....	224
Clay joints, Survey of effect of, on life of malleable furnace refractories.....	571
Clays:	
Bentonites and, for rebonding foundry sands.....	544
Recommended methods for testing bonding.....	561
Refractoriness of.....	163
Coke ratios in cold and hot-blast cupola performance.....	201
Copper-tin alloys for permanent molds.....	396
Core-Sand Mixtures:	
Effect of heat on permeability of sea-coal facing sands and.....	440
Sands and, for high-test cast iron molds.....	122
Core tests.....	541
Corrosion of cast iron, Influence of phosphorus on.....	938
Cost committee sub-committee on inquiries from consumers of jobbing casting, Report of.....	449
Cost-finding problems in relation to molding rates.....	657
Costs:	
Cast iron melting, in electric furnace.....	590
Malleable and gray iron melting, in indirect-arc furnace.....	246
Of related instruction for foundry apprentices.....	316, 321
Of sands and binders for steel castings.....	835
Refractories, in melting gray and malleable iron in indirect-arc furnace.....	248, 251
Report of committee on survey of methods of determining molding.....	609
Cupola:	
Moore hot-blast.....	197
Recommendations for operation of 54-inch.....	49
Cupola blast, Effect of excessive atmospheric moisture in.....	275
Cupola Iron:	
Alloy and high-test, in machine tool and gray iron jobbing foundry.....	115
Analyses for high-strength.....	62
Effect of soaking time on.....	913

	<i>Page</i>
Cupola melting of brass.....	602
Cupola mixtures, Recommended methods for calculation of.....	53
Cupola practice on high-test cast iron.....	118
Cylinder and cylinder-head castings, Electric-process cast iron for.....	585
Cylinder casting, Methods for producing a bronze hydraulic.....	501
Cylinder iron, Analysis for.....	59
Cylinders, Analysis for gas engine.....	62

## D

Deoxidizers as cause of embrittlement in steel castings.....	866
Design of parts for bronze pressure castings.....	498
Duplexing process for producing cast iron.....	586

## E

Electric Furnace Iron:	
Cylinder and cylinder-head castings of.....	585
Impact testing of.....	596
Physical properties of.....	592
Valve tappets of.....	598
Electric furnace practice, Cast iron alloys in.....	225, 594
Electric Steels:	
Experiments to investigate abnormalities in behavior of.....	467
Metallurgical points on acid open-hearth and, for castings.....	458
Embrittlement in Steel Castings:	
Deoxidizers as cause of.....	866
Inclusions and.....	884
Low versus high sulphur in relation to alumina.....	872
Test procedure in investigating.....	878
Etching cast iron samples for microscopic examination.....	814
Etching of brass applied to gating problems, Deep.....	843

## F

Ferrite, graphite, cementite and pearlite in ferrous metals.....	737
Fineness test of sand.....	541
Fluidity of Cast Iron:	
Method for testing.....	513
Phosphorus as affecting.....	788
Fluidity of metal, Effect of, on surface qualities of castings.....	225
Fluidity Testing:	
Bibliography on.....	531
Cast iron.....	285
Pattern equipment for.....	522
Fluxing aluminum alloys before pouring.....	300
Fly wheels, Analysis for auto.....	60
Foundry rate setting, Scientific.....	650
Fuel costs and thermal balances of malleable melting furnaces.....	20

## G

Gamma-ray radiography, Detecting defects by use of.....	65, 67
Gates for bronze pressure castings.....	500
Gating bronze castings made in permanent molds.....	404
Gating problems, Deep etching of brass applied to.....	843
Gating tensile test bar for brass castings.....	844

	<i>Page</i>
Gear bronze, Nickel additions to.....	102
Grading foundry sands, Committee on.....	565
Grain fineness, Effect of, on surface qualities of castings.....	212
Graphite:	
Cementite, pearlite, ferrite and, in ferrous metals.....	737
Formations of, in cast iron.....	762
In cast iron.....	821
Influence of phosphorus on combined carbon and, in cast iron....	934
Gray iron committees on recommended practices, Reports of.....	49
Green-sand-molded steel castings.....	862, 874

## H

Hardness:	
Effect of slight variations in cast iron, on resistance to shear....	697
In cylinder blocks produced from electric-melted cast iron.....	592
Of high-test cast iron from outside to center.....	131
Hardness test, Brinell, of cast iron.....	684
Heat-Resistant Iron:	
Analyses for.....	63
Growth-resistant and.....	153
Heat-treated aluminum-alloy castings, Molding practice for.....	297
Heat treatment of aluminum-alloy castings.....	301
High-Test Cast Iron:	
Analyses for cupola.....	62
Chromium-treated .....	151
Cupola practice for.....	118
Hardness of.....	131
Indirect-arc furnace.....	244
Molybdenum-treated .....	146
Nickel in.....	144, 148
Patternmaker's shrinkage of.....	140
Sands and core mixtures for molds for.....	122
Tests on.....	125
High-test cupola and alloy iron in machine-tool and gray iron jobbing foundry .....	115

## I

Impact test bars, Production of.....	848
Impact testing of electric-furnace cast iron.....	596
Inclusions and embrittlement in steel castings.....	884
Ingot mold irons, Analyses for.....	63
Iron castings, Recommended analyses for classes of.....	59

## J

Jobbing castings, Report of cost committee sub-committee on inquiries from consumers of.....	449
Jobbing foundry, Cupola high-test and alloy irons in machine-tool and gray iron.....	115

## M

Machinability, Effect of phosphorus on malleable and gray cast iron..	951
Machinery iron, Analysis for.....	62
Malleable castings, Recommendations to buyers of.....	452
Malleable founding, Heat consumption per ton of hard iron melting in.	23

	<i>Page</i>
<b>Malleable Furnace Refractories:</b>	
Recommended standards for shapes of.....	569
Survey of effect of clay joints on life of.....	571
<b>Malleable Iron:</b>	
Influence of phosphorus on.....	943
Melting, in indirect-arc furnace.....	225, 236
Method for testing fluidity of.....	513
Structure of.....	794
Malleable iron foundries, British.....	9
Malleable melting furnaces, Thermal balances and fuel costs of.....	20, 24
Malleable-shop point system for determining piece rates.....	645
Manganese, Effect of sulphur and, in cast iron.....	783
Manganese bronze, Recommended practice for.....	42
Manganese-silicon relation in causing inclusions in cast iron.....	423, 425
Melting cast iron in electric furnace, Costs of.....	590
Melting furnaces, Thermal balances and fuel costs of malleable.....	20, 24
Melting gray and malleable iron in indirect-arc furnace.....	225, 236
Melting practice for piston rings.....	279
Microscope as practical aid in cast iron founding.....	733
Microscope parts and operation for cast iron examination.....	802
Microscopic examination, Etching cast iron samples for.....	814
Modulus of elasticity of cast iron.....	691
Moisture, Effect of excessive atmospheric, on cupola blast.....	275
Moisture content, Effect of, on surface qualities of castings.....	212
Moisture-removing system in melting cast iron, Flow diagram of....	278
<b>Mold Hardness:</b>	
Effect of, on surface qualities of castings.....	217
Testing .....	211
<b>Molding Costs:</b>	
Rapid estimation of.....	648
Report of committee on survey of methods of determining.....	609
Molding-machine piece rates.....	635
Molding piece rates, Point system for determining.....	645
Molding practice for heat-treated aluminum-alloy castings.....	297
Molding rates, Cost-finding problem in relation to.....	657
Molding sand research, Report of committee on.....	541
Molding sands for steel foundry, Comparison of natural and synthetic.	161
Molybdenum-alloy pistons, Analysis for.....	60
Molybdenum-treated high-test cast iron.....	146

## N

<b>Nickel:</b>	
Effect of, on bronze foundry mixtures.....	93
In cast iron.....	797
In high-test cast iron.....	144, 148
<b>Nickel and chromium additions, Formula to determine compositions of iron castings for.....</b>	
	798
Nickel-bronze mixtures, Composition of.....	98
Nonferrous castings, Recommendations to buyers of.....	452
Nonferrous committees on recommended practices, Report of.....	37
Nonferrous foundries, British.....	11
Nonferrous metals, Method for testing fluidity of.....	513

## O

Open-hearth and electric steel for castings, Metallurgical points on acid .....	458
Oxidation of cast iron during melting.....	281

## P

	<i>Page</i>
Pattern equipment for fluidity testing.....	522
Pearlite:	
Ferrite, graphite, cementite and, in ferrous metals.....	737
Silicon effect on, in cast iron.....	768
Spheroidized, in cast iron.....	753
Permanent Molds:	
Aluminum alloys in.....	400
Copper-tin alloys for.....	396
Gating bronze castings made in.....	404
Pouring temperatures for bronzes in.....	401
Red brasses in.....	400
Wall thickness of, for bronze castings.....	410
Permanent-mold-cast bronzes, Comparison of Brinell hardness of sand-cast and .....	397
Permeability, Effect of heat on, of sea-coal facing sands and core-sand mixtures .....	440
Phosphorus:	
Contribution to study of influence of, on cast iron.....	923
Effect of, on fluidity of cast iron.....	788
Effect of, on machining qualities of cast iron.....	951
In cast iron.....	822
Influence of, on malleable iron.....	943, 951
Influence of, on physical properties of cast iron.....	929, 931, 934, 938, 939
Phosphorus and sulphur in steel, Report of A. F. A. representative on joint committee on effects of.....	729
Piece Rates:	
Bench work.....	637
Malleable-shop point system for determining.....	645
Molding machine.....	635
Point system for determining molding.....	645
Schedule for determining molding.....	627
Pin Holes in Steel Castings:	
Definition of.....	864
Low-ductility problem and.....	861
Pipe, Analyses for cast-iron.....	62
Piston Rings:	
Analysis for auto.....	61
Melting practice for.....	279
Pistons, Analysis for auto.....	60
Point system for determining molding piece rates.....	645
Pouring Temperature:	
Control of, for aluminum-alloy castings.....	300
Effect of, on physical properties of brass castings.....	847
Effect of, on surface qualities of castings.....	225
For bronzes in permanent molds.....	401
Pressure castings, Bronze.....	496

## R

Radiography:	
Detecting defects by using Gamma-ray.....	65
Explanation of.....	176
Rate setting in foundries, Scientific.....	650
Recommendations for operating 54-inch cupola.....	49
Recommendations to buyers of castings.....	450, 452
Recommended analyses for classes of iron castings.....	59
Recommended definitions for foundry sand terms.....	562
Recommended methods for calculating cupola mixtures.....	53
Recommended methods for testing bonding clays.....	561

	<i>Page</i>
Recommended Practices:	
Reports of gray iron committees on.....	49
Reports of nonferrous committees on.....	37
Recommended standards for malleable furnace shapes.....	569
Refractories:	
Report of representative on joint committee on foundry.....	569
Standards for tolerances in sizes of malleable furnace.....	573
Survey of effect of clay joints on life of malleable furnace.....	571
Refractories costs of melting gray and malleable iron in indirect-arc furnace .....	248, 251
Refractoriness of clays.....	163

## S

Sand deposits, Classification of.....	356
Sand factors which influence surface quality of gray-iron castings....	205
Sand fineness test.....	541
Sand grading, Grain distribution index for.....	506
Sand Grains:	
Character of.....	353
Relation between shape of and strength of.....	857
Sand mixture and bond clay tests.....	546
Sand research, Report of committee on molding.....	541
Sand specification, Typical.....	722
Sand terms, Recommended definitions for foundry.....	562
Sands:	
Clays and bentonites for rebonding foundry.....	544
Comparison of natural and synthetic steel foundry.....	161, 167
Cost of binders and, for steel castings.....	835
Effect of heat on permeability of core-sand mixtures and sea-coal facing.....	440
Facings and, for steel foundries.....	827
For sandslinger.....	124
Loss of bonding strength by heating.....	165
Observations on preparation and use of synthetic.....	718
Origin of.....	354
Reclaimed, used in embrittlement investigation of steel castings..	879
Report of committee on grading foundry.....	565
Schedule for determining molding piece rates.....	627
Schools for foundry apprentices, Continuation.....	316
Sea-coal additions, Effect of, on surface qualities of castings.....	221
Sea-coal facing sands and core-sand mixtures, Effect of heat on permeability of.....	440
Shear test of cast iron.....	681
Shrinkage:	
Influence of phosphorus on cast iron.....	937
Patternmaker's, of high-test cast iron.....	140
Silicon, Effect of, in cast iron.....	739, 768, 817
Silicon and carbon control in melting cast iron in electric furnace....	590
Silicon-manganese relation in causing inclusions in cast iron.....	423, 425
Solidification point of cast iron as affected by phosphorus.....	929
Sorbite structure in cast iron.....	753
Specification sheet for rate setting, Floor molding.....	655
Specifications for typical foundry sand.....	722
Standards for tolerances in sizes of malleable furnace refractories....	573
Steel:	
Definitions of alloy and.....	259
Metallurgical points on acid open-hearth and electric, for castings. 458	
Report of A. F. A. representative on joint committee on effects of phosphorus and sulphur in.....	729
Steel casting, Aluminum as supplementary deoxidizer in.....	872



Steel Castings:	
Aluminum-treated and low-ductility.....	882
Costs of sands and binders for.....	835
Defects in, caused by gas pressure.....	166
Deoxidizers as cause of embrittlement in.....	866
Detecting defects in, by radiography.....	69
Embrittlement and low ductility of,—Discussion.....	886
Formula for comparing quality of.....	463
Green-sand-molded .....	862, 874
Inclusions and embrittlement in.....	884
Low versus high sulphur in relation to alumina embrittlement in.....	872
Pin-hole troubles and low ductility problem in.....	861
Reclaimed sand used in investigation of embrittlement in.....	879
Recommendations to buyers of.....	450
Suggested classifications for.....	262
Test procedure followed in investigating embrittlement in.....	878
Steel foundry industry, British.....	7
Steel Foundry Sands:	
Comparison of natural and synthetic.....	161, 167
Facings and.....	827, 830
Steels for casting, Chemical composition as employed for classifying carbon and alloy.....	257
Sulphur:	
Effect of, in cast iron.....	783
Low versus high, in relation to alumina embrittlement in steel castings .....	872
Sulphur in cast iron, Carbon content and, as affected by soaking time.....	920
Sulphur in steel, Report of A. F. A. representative on joint committee on effects of phosphorus and.....	729
Surface quality of gray iron castings, Sand factors which influence...	205
Synthetic sand, Observations on preparation and use of.....	718

## T

Temperatures in electric-furnace melting of gray and malleable iron .....	225, 236
Tensile test bars for brass castings, Gating.....	844
Tension tests of cast iron.....	667
Test Bars:	
Gating tensile, for brass castings.....	844
Producing impact.....	848
Size and shape of bronze.....	99
Test specimens separately cast, Cast iron.....	674
Tests:	
Acceptance, of cast iron.....	679
Bond clay and sand mixture.....	546
Brinell hardness, of cast iron.....	684
Comparisons of resistance to tension and shear, on bronzes.....	690
Core .....	541
High-test cast iron.....	125
Procedure followed in investigating embrittlement in steel castings	878
Results of fluidity spiral, on various cast irons.....	537
Sand fineness.....	541
Shear, of cast iron.....	681
Shock, of cast iron.....	665, 668
Static flexure, of cast iron.....	664
Tension, of cast iron.....	667
Testing:	
Fluidity, of melted aluminum.....	526
History of cast iron.....	662

	<i>Page</i>
Testing:	
Mold hardness.....	211
Pattern equipment for fluidity.....	522
Recommended method for bonding clay.....	561
Testing mechanical properties of cast iron.....	688
Testing methods, Study of, in relation to cast iron properties.....	661
Time studies, Elementary.....	651

## V

Valve tappets, Electric-furnace iron for.....	598
Valves and fittings, Analyses for cast-iron.....	64

## X

X-Ray as production tool to improve quality of aluminum-alloy castings .....	174
X-ray laboratory of foundries of Aluminum Co. of America.....	178
X-rays and Gamma rays, Practical limits of.....	67

### References to Transactions as printed in Monthly "Transactions" of A. F. A.

References to page numbers as shown in the foregoing and following indexes correspond to issues of the monthly "TRANSACTIONS" of the American Foundrymen's Association, in which the 1931 Transactions material has appeared according to the following schedule:

	<i>Pages</i>
June, 1931 .....	1- 64
July, 1931 .....	65-160
August, 1931 .....	161-256
September, 1931 .....	257-352
October, 1931 .....	353-448
November, 1931 .....	449-512
December, 1931 .....	513-608
January, 1932 .....	609-732
February, 1932 .....	733-860
April, 1932 .....	861-964

# Authors' Index

	<i>Page</i>
ALLAN, JAS. R.—Foundry Refractories.....	569
ALLEN, ROY M.—Microscope as a Practical Aid in Cast Iron Foundry	733
BATTY, GEORGE—Interrelationship of Pin-Hole Trouble and Low-Ductility Problem .....	861
BELT, R. E.—Report of Cost Committee Sub-Committee on Inquiries from Consumers of Jobbing Castings.....	449
BENNETT, J. C. and VOGEL, J. H.—Melting of Gray and Malleable Iron in Indirect-Arc Furnace.....	235
BRAH, S. M.—Related Class-Room Training for Foundry Apprentices	312
Survey of Methods of Determining Molding Prices in Quad City District .....	619
BRIGGS, CHAS. W. and GEZELIUS, ROY A.—Detecting Defects by Radiography, Using Gamma Rays.....	65
BROMER, H. E.—Electric Process Iron for Cylinder and Cylinder-Head Castings .....	585
BULL, R. A.—Chemical Composition as Employed for Classifying Carbon and Alloy Steels for Castings.....	257
Report of A. F. A. Representative on Joint Committee on Effects of Phosphorus and Sulphur in Steel.....	729
COLE, H. J.—Comparison of Natural Bonded and Synthetic Molding Sands for Steel Foundry.....	161
CONANT, G. D. and RIES, H.—The Character of Sand Grains.....	353
COOK, F. J.—New Type of Inclusion in Cast Iron and Its Relation to Manganese and Silicon Content.....	423
CROWN, J. E.—Bronze Pressure Castings.....	496
DESSENT, J. and KAGAN, M.—Contribution to Study of Influence of Phosphorus on Iron .....	923
FALK, H. S.—Starting a Program of Community Apprenticeship.....	336
FAULKNER, VINCENT C.—Some Notes on Structure of British Foundry Industry .....	1
FAWCETT, LEWIS H.—Molding Practice for Heat-Treated Aluminum Alloy Castings .....	297
GEZELIUS, ROY A. and BRIGGS, CHAS. W.—Detecting Defects by Radiography, Using Gamma Rays.....	65
GINGERICH, E. M. and ROWE, H. J.—X-Ray as Production Tool to Improve Quality of Aluminum-Alloy Castings.....	174
GREDE, W. J.—Report of A. F. A. Committee on Survey of Methods of Determining Molding Costs.....	609
HARRISON, T. M.—Scientific Rate Setting in Foundries.....	650
HRUSKA, J. H.—Thermal Balances and Fuel Costs of Malleable Melting Furnaces .....	20
JACKSON, CLARENCE E.—Grain Distribution Index for Sand Grading..	506
KAGAN, M. and DESSENT, J.—Contribution to Study of Influence of Phosphorus on Iron.....	923
KIHLGREN, T. E. and PILLING, N. B.—Some Effects of Nickel on Bronze Foundry Mixtures .....	93

KILEY, T. F. and SHERWIN, L. M.—Cupola High-Test and Alloy Irons in Machine Tool and Gray Iron Jobbing Foundry.....	115
KNIGHT, L. B.—Some Observations on Preparation and Use of Synthetic Sand .....	718
KRYNITSKY, A. I. and SAEGER, C. M., JR.—Practical Method for Studying Running Quality of Metal Cast in Foundry Molds.....	513
LEE, V. and RIES, H.—Relation Between Shape of Grains and Strength of Sand.....	857
MACKEIE, JAS. T.—The Moore Hot-Blast Cupola.....	197
MACNEILL, W. J.—Point System for Determining Molding Piece-Rates.....	645
MARIUS, HENRI—Permanent-Mold Practice for Bronze Castings.....	393
MAULAND, T.—Cupola Melting of Brass.....	602
MELMOTH, F. A.—Some Metallurgical Points on Acid Open-Hearth and Electric Steel for Castings.....	458
MOORE, NEIL A.—Effect of Excessive Atmospheric Moisture in Cupola Blast .....	275
NICHOLS, A. S.—Steel Foundry Molding Sands and Facings.....	827
NICOLAU, PIERRE—Contribution to Studies of Methods for Control of Foundry Products .....	661
PARSONS, R. W.—Deep Etching of Brass Applied to Gating Problems.....	843
PILLING, N. B. and KIHLGREN, T. E.—Some Effects of Nickel on Bronze Foundry Mixtures.....	93
REICHERT, W. G. and WOOLLEY, D.—Factors Which Influence Surface Quality of Gray Iron Castings.....	205
RIES, H.—Report of A. F. A. Committee on Molding Sand Research..	541
RIES, H. and CONANT, G. D.—The Character of Sand Grains.....	353
RIES, H. and LEE, H. V.—Relation Between Shape of Grain and Strength of Sand.....	857
ROWE, H. J. and GINGERICH, E. M.—X-Ray as Production Tool to Improve Quality of Aluminum-Alloy Castings.....	174
SAEGER, C. M., JR., and KRYNITSKY, A. I.—Practical Method for Studying Running Quality of Metal Cast in Foundry Molds.....	513
SAUNDERS, WALTER M. and SAUNDERS, WALTER M., JR.—Effect of Heat on Permeability of Sea-Coal Facing Sands and Core-Sand Mixtures.....	440
SAUNDERS, WALTER M., JR. and SAUNDERS, WALTER M.—Effect of Heat on Permeability of Sea-Coal Facing Sands and Core-Sand Mixtures.....	440
SHERWIN, L. M.—Report on Foundry Price-Setting System of Brown & Sharpe Mfg. Co.....	634
SHERWIN, L. M. and KILEY, T. F.—Cupola High-Test and Alloy Irons in Machine Tool and Gray Iron Jobbing Foundry.....	115
SPENCER, W. H. and WALDING, M. M.—Effect of Soaking Time on Initial Temperature and Analysis of Cupola-Melted Iron.....	913
VOGEL, J. H. and BENNETT, J. C.—Melting of Gray and Malleable Iron in Indirect-Arc Furnace.....	235
WALDING, M. M. and SPENCER, W. H.—Effect of Soaking Time on Initial Temperature and Analysis of Cupola-Melted Iron.....	913
WOOLLEY, D. and REICHERT, W. G.—Factors Which Influence Surface Quality of Gray Iron Castings.....	205

